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Remarks

Claim Rejection 102

Referring to the examiner's citation of Shafer column 3, lines 42-50.

"The embodiment of the invention shown in FIG. 1 also includes securing nuts 60 that may be used to secure the wellhead assembly to the protruding wellhead pipe. In one embodiment, a pipe clamp 26 that extends circumferentially around the first substantially hollow cylindrical member 12 may also be included. This pipe clamp 26 may be adjusted using the tightening mechanism 28 to counteract the tendency of the first hollow cylindrical member 12 to expand in response to elevated gas temperatures in the protruding wellhead pipe 20. In this manner the seal between the protruding wellhead pipe and the first hollow cylindrical member is maintained."

Point 1: **Error in Citation:** Shafer does not teach axial expansion. The terms axial and expansion do not appear in Shafer at all. Shafer function is not axial expansion.

Point 2: Applicant agrees with examiner that Shafer teaches a joint that can be adjusted to compensate for temperature expansion due to unanticipated higher temperatures in the gas stream. However Shafer's expansion is circumferential between clamped surfaces of pipes as stated above and is not axial expansion as Bettinger.

Point 3: **Error in Citation:** Shafer is a fixed joint. Bettinger is a telescoping joint. Shafer's claim 1 citing a "cylindrical member being capable of slidably and removably receiving said wellhead pipe" refers to the assembly of the joint, rather than a telescoping function of the joint.

Point 4: Shafer's adjustment as cited above is to overcome (minor and local) circumferential temperature expansion. Bettinger overcomes (large and systemic) axial temperature expansion of linear runs of some length of pipe. Bettinger discloses, *"Another object of the current invention is to provide an expansion joint for a liquid rocket engine fuel delivery system where cryogenic temperatures create large excursions in long pipe runs."*

Point 5: Shafer's local re-adjustment is manual. As stated in point 2 above Shafer teaches a fixed connection that uses the pipe clamp for re-adjustment to prevent leakage during elevated temperatures. This manual re-adjustment of Shafer takes place after constant monitoring and observing a need due to leakage or over stress joint failure. Bettinger is a tighten once and then circumferential temperature compensation is automatic due to selection of "materials resistant to cryogenic temperatures."

Point 6: Shafer's systemic re-adjustment is manual during interrupted operations. Shafer discloses in col. 3, line 4-7, " *When settling of the landfill occurs, the wellhead assembly may be slidably removed, the protruding wellhead pipe may be cut, and the wellhead assembly may slidably receive the new end of the protruding wellhead pipe.*" Shafer manually detaches and reattaches the wellhead during interrupted operations.

Bettinger disclosed automatic responsiveness during operation in the objects as follows: *"Another object of the current invention is to provide the basis for automatic changes for seal pressure in response to changing operating conditions."*

However, applicant agrees that applicant's claim 1 could be further polarized to emphasize the automatic adjustment during fluid flow operations. Please amend claim 1 as follows.

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1. A compressed seal expansion joint comprising:
at least one generally cylindrical resilient and elastic seal disposed in an annular packing chamber defined between
telescopically arranged outer and inner pipe members, and
an outer circumferentially tensioned band and clamp positioned and selected to produce a compressive force to radially deflect said outer pipe member and thereby compress and deflect said generally cylindrical resilient and elastic seal so that said outer and inner pipe members and said generally cylindrical resilient and elastic seal create and maintain a bearing and friction-loaded sealed relationship for **and during** *fluid flow at varying temperatures between adjacent ends of two conduits during axial sliding and rotational relative movement of said outer and inner pipe members.*

Material: Applicant agrees with examiner that the type of fluid or gas that is conducted by the conduits is not material to the application.

Claim Rejections 103

Second Clamp: Shafer: Applicant agrees that if Shafer had all the distinctions of Bettinger that adding a second band would have been obvious. However, in light of claim 1 being upheld vs. Shafer the question is moot.

Composites: Shafer: Applicant agrees that if Shafer had all the distinctions of Bettinger that specifying a composite material would have been obvious. Composite materials can be stronger than metals and therefore composite pipe can be thinner and more capable of elastic deflection without failure. Thus composites are the preferred material for the current invention but not necessary for the current invention. However, in light of claim 1 being upheld vs. Shafer the question is moot.

McHughs in view of Shafer: Examiner has rightly cited these two teachings that appear to have some of the same elements as the present invention. Applicant does not agree with examiner that, "McHughs presents a packing sealed expansion joint (14) comprising: at least one generally cylindrical resilient and elastic seal (44) disposed in an annular packing chamber (see Figure 3) defined between telescopically arranged outer (20) and inner (24) pipe members."

Point 1: **Error in Citation - McHughs**: McHughs does not use the word elastic, and only uses the word resilient in his objects to mean "resilient to wear." This citation is in error. Without an elastic or resilient (bounce back meaning) packing material this combination will not function as Bettinger.

Point 2: **Error in Citation – Shafer:** Shafer does not teach a "packing sealed expansion joint" or show such a joint in Figure 2 as cited. Figure 2 shows a construction for assembly and disassembly of a fixed pipe joint as discussed in points 3 & 4 in the 102 response above.

Point 2: **Arbitrary Selection of Function:** Shafer is a fixed joint. McHughs is an axial expansion joint. The mixing of elements used for a fixed joint with a telescoping joint to indicate obviousness is an unbalanced argument. The result could as easily be the opposing combination, that being a fixed joint with dual packing rings instead of a moveable joint with one clamp. It is arbitrary to consider this combination possessing only one of the two possible functions. Bettinger is too specific for an arbitrary combination to work as stipulated.

Point 3: **Immovable vs. Selected Deflection**: Shafer uses both nuts and a ring-clamp to fasten his fixed pipe joint in an **immovable** condition. McHughs is a telescoping joint. To make

the combination work one must arbitrarily ignore Shafer's nuts that lock up the joint, and also partially tighten Shafer's ring clamp to a **selected deflection** on McHugh. In fact neither of the combination uses the word deflection. This combination cannot function as Bettinger without these additional distinctions being arbitrarily added.

Point 4: **Clamping force vs. selected force:** Shafer **clamps** a fixed joint. Bettinger uses a **selected** force to deflect the outer pipe and thus the seal. Without a selected force or the partial tightening of a cylindrical band the combination will not function as Bettinger.

Point 5: **Clamping vs. Compressing:** Shafer only clamps the surfaces of the two pipes together making a fixed joint and seal. Shafer Claim 7 reads, "*a clamping ring member extending circumferentially around said first substantially hollow cylindrical member, said clamping member including a means for adjusting the size of the ring from a loose, released condition to a tightened, engaged, condition thereby to compress said inner wall of said first substantially hollow cylindrical member against said protruding wellhead pipe.*"

Adding a fixed clamp that forces the faces of the pipe together is not an advantage to a telescoping system like McHugh. No language in Shafer indicates his clamp partially or elastically compresses the seal. Bettinger agrees that the claim 1 language of the current application confuses this point by connecting terms like "clamp" and "band" that are not equivalent. Bettinger did not wish to imply that the word clamp meant "fix" or "hold" as it means in Shafer. Bettinger used the term to mean, "surround the pipe in a fixed position with a selected force." Please amend claim one to eliminate "clamp" (see below).

Point 6: **Location of Compression:** Applicant in his first response to the examiner's point on this combination of these two teachings emphasized the location and positioning of the elements as described for Shafer was lacking to duplicate the present invention. Bettinger positions the band over the seals. This positioning is not suggested in either McHughs or Shafer.. Thus the combination will not function together.

Point 7: **Elastic Response during Telescoping Movement:** Shafer provides o-rings which are crushed during assembly. McHughs' sealant material is packed to provide an initial sealing resistance to leakage. Neither Shafer or McHughs use the terms elastic, deflection, or stress. Bettinger uses external force to put internal elastic pressure on the sealant, which is a notable innovation. This internal pressure is responsive to maintain the seal during telescoping movement. The combination cannot function with elastic compression in the manner of Bettinger. However, Bettinger's claim 1 could be modified to better emphasize the elastic distinction.

Please modify claim 1:

1. A compressed seal expansion joint comprising:

at least one generally cylindrical resilient and elastic seal disposed in an annular packing chamber defined between

telescopically arranged outer and inner pipe members, and

an outer circumferentially tensioned band ~~and clamp~~ positioned and selected to produce a compressive force to radically deflect **elastically** said outer pipe member and thereby compress and deflect said generally cylindrical resilient and elastic seal so that said outer and inner pipe members and said generally cylindrical resilient and elastic seal create and maintain a bearing and friction-loaded sealed relationship for **and during** fluid flow at varying temperatures between adjacent ends of two conduits during axial sliding and rotational relative movement of said outer and inner pipe members.

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Other Claims: Claim one is upheld. All dependent claims are upheld as well.

Applicant very much appreciates examiner's response that has led to these clarifications.

Respectfully submitted,

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